

Title	Proficiency-based progression training: an 'end to end' model for decreasing error applied to achievement of effective epidural analgesia during labour: a randomised control study
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Metrics for labor epidural catheter placement

Start of procedure: Anaesthetist entering the room

End of procedure: Anaesthetist leaving the room after completion of the procedure

Metrics

- I. Initial patient interaction
- II. Positioning
- III. Maintaining asepsis
- IV. Preparation and positioning of equipment
- V. Handling sterile epidural preparation field and disinfection of epidural insertion site
- VI. Identifying appropriate interspinous space after fenestrated drape
- VII. Local infiltration
- VIII. Needle insertion /Attachment of loss of resistance (LOR) syringe/identifying LOR
 - a) Attachment of LOR syringe and advancement of needle
 - b) Attempts in first interspinous space
 - c) Subsequent attempts
- IX. Catheter insertion
- X. Test dose and securing the catheter
- XI. Loading dose and assessment of block

No	Metrics and definition (Task/subtask)	Error
I:	Initial patient interaction	Error
1	Does not explain the procedure	
2	Does not explain risks involved	
3	No verbal consent obtained	
II:	Positioning	Error
4	Patient not positioned at the edge of the bed	
5	Patient not positioned in the middle third of the bed	
6	Bed not flat and parallel to floor	
7	Does not establish a clear working environment (eg: one or more of the following things not done appropriately- dress taped, CTG monitor belt moved away from field , IV lines and monitor cables away from the working field)	
III:	Maintaining asepsis (refer to table at the end please)	
IV:	Preparation and positioning of equipment	Error
8	Does not position the trolley within 90 degree arc	
9	Does not attempt to identify the landmarks (palpates iliac crest with both hands and identifies midline) prior to scrubbing	
V:	Handling sterile epidural preparation field and disinfection of epidural insertion site	Error
10	Does not check drug name and expiry with midwife	
11	Does not use filter needle to draw up local anesthetic for test dose or saline to be used for loss of resistance	
12	Does not flush epidural catheter with filter attached(not necessarily removing catheter from pack)	
13	Does not prep the back appropriately (Betadine circular motion from center Alcohol horizontal movements)	

14	Failure to prep appropriate amount of area (A4 size)	
15	Does not give adequate time for antiseptic solution to act (application of antiseptic to insertion of needle – 3 min for betadine and 60 sec for chlorhexidine skin preparation stick)	
16	Placing fenestrated drape without removing adhesive tape both from center hole and top	
17	Does not get a new drape if position of drape is to be adjusted	
VI:	Identifying appropriate interspinous space after fenestrated drape	Error
18	Does not request patient to arch the back	
19	Does not identify landmarks again (palpates iliac crest and/or palpate midline) prior to local infiltration	
20	Landmark reconfirmed > 5 times	
VII:	Local infiltration	Error
21	Does not dry betadine (after 3 minutes) if still wet prior to infiltration of local anaesthetic	
22	Uses more than 5 ml of lignocaine for skin infiltration	
23	Does not give adequate time for local anaesthetic to work (90 sec)	
VIII	Needle insertion / Attachment of loss of resistance (LOR) syringe / Identifying LOR	
a)	Attachment of LOR syringe and advancement of needle	Error
24	Direction of insertion downward or? > 45 degree cephalad	
25	Stylet of epidural needle not placed in sterile field	
26	Connects loss of resistance syringe with more than half barrel of air	
b)	Attempts in first interspinous space	Error
27	More than 2 passes in the same direction	
28	Alteration in direction not limited to single plane in any new pass	

29	Second attempt in the same space without change of angulation in either or both planes	
30	More than 5 minutes in same attempt	
c)	Subsequent attempts	Error
31	Does not wait for local anesthetic to work	
32	Does not prep again if drape is removed	
33	Undertakes an attempt in an unprepared and unsterilized interspace	
34	On seeing blood in epidural needle, the anaesthetist proceeds with the same needle without flushing with saline or changing the needle	
35	Injects more than 0.5 ml of air	
36	Returns syringe to any place other than sterile field*	
IX:	Catheter insertion	Error
37	Threads catheter during contraction	
38	Inserts catheter with caudal angulation or direction	
39	Does not stabilize needle while passing catheter	
40	Pulls catheter back through needle	
41	Advances needle over catheter at any point	
42	Rotates epidural needle after catheter insertion	
43	Inserts epidural catheter without mentioning paresthesia to the patient	
44	Does not place epidural needle back in sterile "TRAY"	
45	Failure to aspirate catheter "gently" with 2 ml syringe prior to fixing	
46	Continues to administer local anaesthetic with blood in the catheter	
47	If there is blood in catheter does not perform one of the following options – A) pull back by 1 cm and re aspirate up to 2 times. B) Pulls catheter out C) Flush catheter with saline up to 2 times	
48	Injecting local anaesthetic to flush blood in catheter	
49	If CSF in catheter is suspected does not perform one of the following actions – A) Take out the catheter. B) Use it as a spinal catheter	

50	Proceeds to inject local anaesthetic dose of >5ml despite aspirating clear fluid in the epidural catheter	
X:	Test dose and securing catheter	Error
51	Does not loop the catheter or use fixating device for taping	
52	Tapes less than half way up the back	
53	More than 3 ml of Test dose (2% Lidocaine) administered	
54	Administers test dose during contraction	
XI:	Loading dose and assessment of block	Error
55	Does not ask patient for symptoms for intravenous local anesthetic prior to loading dose	
56	Failure to assess possibility of inadvertent intrathecal injection of local anaesthetic (failure to ask or identify sensory/motor symptoms prior to loading dose)	
57	Does not check blood pressure prior to loading dose	
58	Does not check the local anaesthetic solution used for loading dose(name and expiry date)	
59	Administers less than 10 ml to more than 20 ml of loading dose	
60	Does not communicates with patient during loading dose	
61	Fails to disconnect syringe containing local anaesthetic from epidural apparatus following completion of administration of loading/test dose	
62	Failure to ensure that filter hub is kept sterile	
63	Does not document BP prior to leaving the room	
64	Anaesthetist leaves the room without hearing that the patient is getting more comfortable during contractions	

	Maintaining asepsis	Stage VI	Stage VII	Stage VIII	Stage IX	Stage X	Stage XI
65	Not bare below elbow except wedding ring (exception – if wearing sterile apron)						
66	Hand wash not done as per guidelines (alcohol gel if no visible contamination of hand for 90 sec / scrubbing with antiseptic soap)						
67	Not maintaining asepsis during donning of sterile gloves and/or not changing sterile gloves if it is contaminated during the procedure						
68	Not observing and changing equipment if it gets contaminated						
69	Fenestrated drape contaminated and not replaced						
70	Betadine solution cup/ sponge holding forceps/Chlorhexidine stick /gauze used to dry betadine - left in sterile field after use						
71	Any equipment placed in patient drape instead of the sterile field*						
72	Unsheathed needle placed outside sterile "TRAY"**						
73	Re-sheathing needle any time during the procedure						
74	Using sterile gloves in unsterile area after completion of sterile procedure without removing or changing the gloves						

*Sterile field – area within sterile drape used for epidural preparation

**Sterile plastic tray – plastic cup/tray within epidural preparation field

Text in red point to critical errors